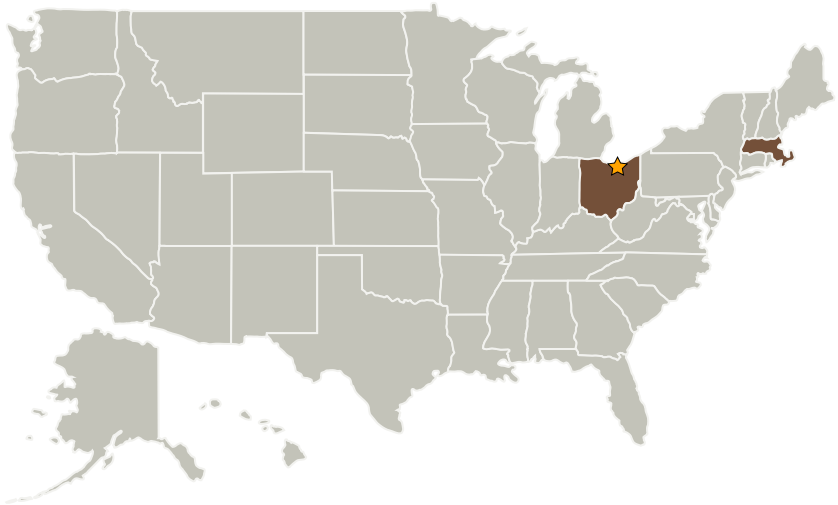
Superconducting Aero Propulsion Motor, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

Superconducting electric propulsion systems will yield improvements in total ownership costs due to the simplicity of electric drive when compared with gas turbine engines, and due to greater power densities and efficiencies of electromechanical energy conversion processes. Two principal types have been considered in Naval propulsion studies that have promise for all electric aircraft. Both of these classes of motor, however, have technical risk attributes that are less than ideal with respect to reliability and efficiency: complex rotating cryocoolers for the AC synchronous machine, and low voltage (hence high current) brushed armatures for the DC acyclic (homopolar) machine. SatCon proposes a 'stationary field synchronous motor', which combines the benefits of both synchronous and acyclic motors by combining the ability to use COTS cryocoolers inherent to the acyclic motor with power transfer to the armature at reasonable voltage and current levels. This will be traded off against an AC synchronous machine using a rotating cryocooler with a novel flow management design to reduce the complexity and losses. The result of the two-phase effort will be the design, prototyping, and testing of an improved power density superconducting propulsion motor suitable for aircraft propulsion applications.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Satcon Technology Corp	Supporting Organization	Industry	Boston, Massachusetts

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.3 Electrical Power Conversion and Regulation